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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
OGDEN UTAH

No. 56 June 1958

WEATHER RECORDS AS GUIDES TO AIR-DRYING LUMBER

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Wood when stacked and left in the open dries as a result of exposure to temperature, humidity, and air movement (wind). Wood dries from the outside in; that is, the outer surfaces of a board dry first, and drying progresses inward. Ends of boards dry quickest. When the board attains uniform moisture content--equal dryness--throughout its cross section it is said to be equalized. For any given combination of temperature and relative humidity, wood equalizes at a given moisture content, a value called the Equilibrium Moisture Content (EMC). When dried wood is rewet it absorbs water, and its moisture content increases.

Moisture content of lumber is expressed as a percentage, which is the ratio of the amount of water to the amount of bone-dry wood substance. This method of expressing wood moisture content is generally accepted among major sellers and buyers and can be determined by using any of the several available electric wood moisture meters.

Lumber buyers frequently specify a definite moisture content because different moisture contents are required for different uses. Sash and door plants generally require lumber to be dried to 10 or 12 percent; some cabinet makers and furniture plants may specify as low as 8 percent; building contractors frequently require structural lumber to have no more than 15 percent moisture. Hence, the lumber manufacturer has to meet these standards. Air-dried lumber (or kiln-dried lumber stored, after drying, in the yard) does not always meet these specifications.

Lumber can be air-dried satisfactorily in most locations in the Rocky Mountain area during the major part of the year. The period favorable for outdoor air-drying varies according to location and from year to year. General guidelines for eight selected locations in Idaho, Montana, Utah, and Wyoming are shown in the accompanying graphs. They correlate weather records with Equilibrium Moisture Contents.

The weather data on these graphs are averages for several years. Although average temperatures and humidities for future years may deviate somewhat from those shown here, it is unlikely that these deviations will be very great. Temperature is the dry bulb measured in degrees Fahrenheit; relative humidity (RH) is the percent moisture in the air at that given temperature; EMC is the percentage moisture content that wood will attain at the given temperature and humidity.

If 12 percent is a desirable moisture content at which to surface and ship lumber, a mill located in a climate like that of Lander, Wyoming, can expect such dryness from about the first week in February until sometime in December. During July, August, and September, lumber commonly dries to about 8 percent.

Lewiston, Idaho, on the other hand, must usually wait until the third week in March before lumber dries to 12 percent; and the season for air-drying usually ends about the second week in October; there are only about 30 days in July and August when 8 percent can be reached. Missoula, Montana, has about the same period for drying to 12 percent, but the minimum percentage that can be reached there is only 10.

Lumber producers can use these charts as indicators for air-drying in their own localities. To use them, first select the graph that most nearly approximates the climate at your own mill. Then read directly on the EMC curve the calendar period when you can expect any selected moisture content to be reached.

Lumber dries fastest when temperatures are highest and humidities are lowest. The time needed for green lumber to reach shipping moisture content at any given EMC will vary: It may require as few as 10 days for 1-inch heartwood commons, or as long as 2 to 3 months for thick sapwood clears. Once wood is dried, it should either be shipped to the buyer immediately or should be stored in a dry shed. If left outdoors it will absorb moisture when wet fall weather returns. It cannot again be dried outdoors until late spring or early summer.

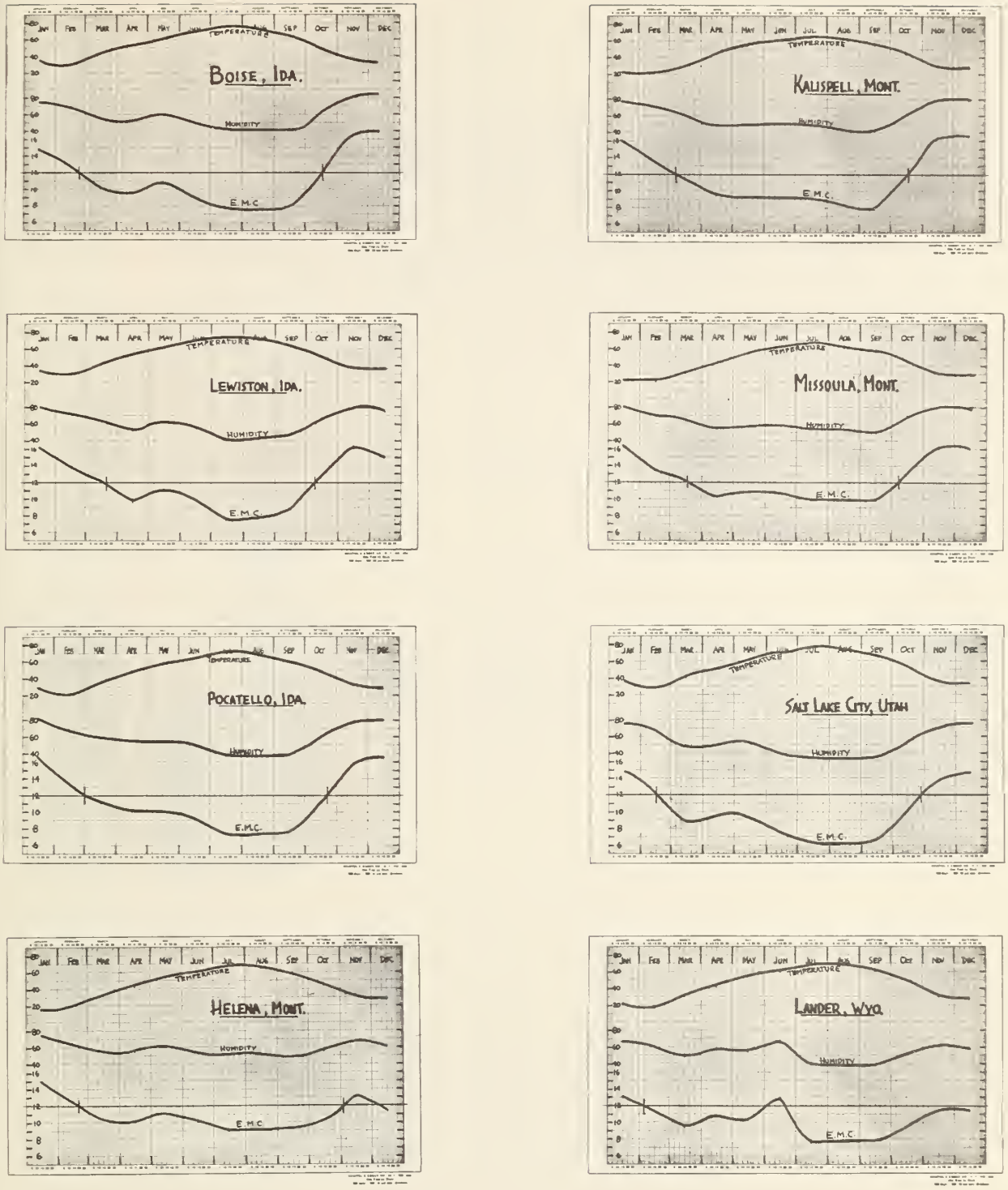

Figure 1.--Relationship of temperature and humidity to Equilibrium Moisture Content at selected locations in the Rocky Mountain region. (Data on temperature and humidity from U. S. Weather Bureau. Climatological Data, 1951-1956)